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West Europe Report

SCIENCE AND TECHNOLOGY

No. 125

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CONTENTS

INDUSTRIAL TECHNOLOGY

BIOTECHNOLOGY

HYBRID DNA TECHNOLOGY USED IN COMMERCIAL PRODUCTION OF HGH

Stockholm NY TEKNIK in Swedish 1 Jul 82 pp 10-11

/Article by unnamed: "Europe's First Factory for DNA Hormone"/

/Text/ The world's largest producer of human growth hormone, Swedish Kabi Vitrum, is today ready to increase the production of growth hormone more than 10 times.

A factory for bacteria-produced growth hormone has been completed in Strangnas. The factory will be the first in Europe where the controversial hybrid-DNA technique will be used in commercial production.

Growth hormone is given to children who have stopped growing. Up to now the production has been far from sufficient: The hormone was taken from the pituitary glands of dead humans.

But the hybrid-DNA technique will not result in a drop in the price of growth hormone. A patient needs 150 vials per year, and each vial costs 368 kronor at the pharmacy. No price reduction has been planned by Kabi Vitrum.

Attenuated Intestinal Bacterium

With the hybrid-DNA technique bacteria can be made to produce growth hormone. The bacterium which will be used is a variant on the common human intestinal bacterium E-coli. For safety reasons the bacterium has been attenuated so that it cannot live outside the laboratory environment. The prepared form is called E-coli K 12.

In the debate about the risks of the hybrid-DNA technique it has been mentioned that bacteria with dangerous characteristics might escape from the laboratories and spread. The DNA researchers believe this is impossible with the sensitive K 12 bacterium.

"The problem is rather to keep it alive in the factory," says Einar Wikstrom, who is head of the technical division of Kabi Vitrum's factory in Strangnas.

Lowest Class of Risk

According to the regulations of the Board of Occupational Safety and Health, this type of activity may be conducted at four levels called P1-P4, depending on the amount of hazard it is judged to present.

P1 is the lowest level, corresponding to an ordinary microbiological laboratory. P4 is the highest level with very strict hygienic requirements. Only two laboratories of this type exist in Europe, one in the FRG and one in Great Britain. The Strangnas facility is classed as P1.

As early as 1978 Kabi contacted the U.S. company Genentech, which has specialized in hybrid-DNA. The two companies agreed that Genentech would try to develop a bacterium which could produce growth hormone. If Genentech succeeded, it was to get the U.S. and Canadian market and Kabi the rest of the world. It took Genentech 1 year to produce the bacterium, a considerably shorter time than expected.

Transferred to Sweden

With the aid of enzyme a sequence corresponding to the human growth hormone was introduced into the DNA chain of the coli bacterium. (See the sketch /not reproduced/.) The bacterium was also made resistant to tetracycline which is an antibiotic.

When tetracycline was then added to the bacterial culture only those bacteria survived which were resistant and had the capability of producing growth hormone. One out of 10,000 bacteria then remained in the culture. The prepared bacterial solution was then transferred to Sweden and is being multiplied here through ordinary bacterial culture.

"It probably cost around 10-12 million kronor to develop the bacterium," says Anders Eriksson, who is head of production at Kabi in Strangnas.

Final Purification in Stockholm

The production of growth hormone, which is a rather time-consuming process, takes place both in Strangnas and in Stockholm. In Strangnas a semimanufactured product is made, which later undergoes its final purification in Stockholm.

The bacterium is first grown in the laboratory in volumes of 3-4 liters, then in 50-liter inoculation tanks and at the end in the 1,500 liter final tank, which is the limit Kabi was given by the permit-granting authorities. After completed fermentation the number of bacteria is about 10^{11} per milliliter.

The solution is concentrated to 150 liters in separators. The excess amount goes to a separate tank in order to be killed off with steam, which is a safety requirement by the Board of Occupational Safety and Health.

The Bacteria Are Broken Apart

The remaining concentrate then passes through several homogenizers, which means that the bacteria are torn apart during a rapid pressure change. The breaking up is necessary to retrieve the growth hormone which is contained in the bacteria; 98-99 percent of the bacteria are torn apart with this treatment, the remainder goes into a tank to be killed.

"Sometimes we think the safety requirements are a little ridiculous, but they are trivially simple to fulfill," Anders Eriksson says.

Ten Times Greater Capacity

After sterile filtration the solution is frozen in plastic bottles and sent to Stockholm where the final purification takes place.

The capacity of the Strangnas facility is about 7 million doses annually using growth hormones from pituitary glands, which gives Kabi 70 percent of the world market. With the new hybrid-DNA technique, however, the capacity will increase more than 10 times. Twenty-four hours' production in the new facility is the equivalent of doses from 12,000 pituitary glands.

But the new growth hormone will not be marketed until 1984. Now, it will first be clinically tested for a few years.

11949
CSO: 3698/2

PROGRAM LAUNCHED TO COORDINATE, AID BIOTECHNOLOGIES

Paris SCIENCES ET AVENIR in French Sep 82 pp 13-14

[Article: "Biotechnologies To The Rescue of Microbiology"]

[Text] French microbiology lags behind and our bio-industries represent but an insignificant part of the world market. This fact is not new, and it is certainly not too early for a government to become seriously preoccupied with a situation as detrimental, in the long run, to the independence of our country as the virtual abundance [sic] [absence?] of France on the computer market.

The Douzou mission report, presented to the press at the official launching, in July, of a three year "mobilizing program" for the development of biotechnology, emphasizes the "alarming lag behind the United States and Japan," and could have pointed to the lag, which is even more serious, behind Great Britain and Germany. Our deficiencies are just as evident in the field of basic research as in industry.

The report appropriately lists sectors which have received "very little attention" from research organizations, in particular, with regard to the "application of biological reactions": growth and production kinetics, stoichiometry and yields, culture of microorganisms and cells, enzyme engineering, reactors, extraction and purification, analytical and chemical synthesis control apparatus. The report also notes, in spite of the existence of companies such as Transgene, in Strasbourg, and the Rhone-Poulenc, SNEA (SANOFI) or Roussel-Uclaf investments, the small number of firms working in this field in France and their almost total absence in certain particular sectors such as enzyme engineering.

The aim of the program is twofold: coordination and assistance. In the first place, the interministerial "Coordination Committee" will be responsible for strategy, under the careful control of a "National Committee" made up of "qualified representatives of the socio-economic forces." A "Mission" from the Ministry of Research and Industry, will manage the program itself. The latter, at the end of this year, will already account for a public expenditure of 1.1 billion francs and "if everything happens as planned," this amount will increase to 1.43 billion francs next year. The long term

objective is modest in appearance: from 7.5 percent to 10 percent of the bioindustrial world market in 1992.

The government intends to systematically encourage public and private research programs to be presented in this field. Assistance to firms will represent 600 million francs over a three year period. A series of technical bulletins marked with the "confidential secret" seal describe approximately fifteen industrial projects. Mr Chevenement has stated: "We are on the point of having available six genetic engineering companies and three companies dealing with cellular immunology."

9286
CSO: 3102/447

FIRST BIOTECHNOLOGY-PRODUCED MEDICINES IN TWO YEARS

Duesseldorf EUROPA CHEMIE in German 9 Jul 82 p 321

[Text] Dr. Barrie G. James, vice president of "Biogen SA," Geneva, one of the leading European biotechnology enterprises, assumes that the first pharmaceuticals, made according to new biotechnological methods, will be placed on the market in a few years. The first products synthesized according to DNA techniques (genetic engineering) will be pharmaceuticals already on the market although they will be obtained from new preliminary products and the yield will be greater; here we might mention antibiotics, enzymes, steroids, and vitamins (timing: roughly in about 2 years).

Within 4-6 years we might then have medications on the market which James describes as "analogons" to existing products but which can be produced more cheaply, with better quality, and less side effects, such as human insulin, blood factors, human albumin, human growth hormones, interferons, hepatitis-B vaccine, urokinase. James, who reported to the "Pharma 82" conference held in Geneva, did however admit that the insulin on the market would certainly not disappear; it could certainly still retain a market share of about 50 percent for a long time.

According to James, the first biotechnologically produced "absolute novelties" are supposed to come out after about 8 years and they would include the following: malaria vaccines, beta-Endorphines, gamma-Interferon, and thymosin.

The long-term program of the genetic technologists furthermore include neuropeptides, immunotropics, behavior-influencing substances, and finally specifically target-oriented gene therapy.

5058
CSO: 3698/19

DIRECTORATE HEAD INTERVIEWED ON FRANCE'S ELECTRONICS PROGRAM

Paris ZERO UN INFORMATIQUE MENSUEL in French Oct 82 pp 100-103

[Interview with Jean-Claude Hirel, director of DIELI, by Jean-Marc Chabanas]

[Text] The action program for the electronics branch, presented by the government during the summer of 1982, is particularly ambitious. In five years, France must acquire a technologic mastery of the branch, recover a balance of trade surplus, triple the annual growth rate, create 80,000 additional jobs, train 7000 more engineers and advanced technicians per year than it does at present, conduct national research projects, and so on. The director of the Directorate of the Electronics and Data Processing Industry (DIELI), Jean-Claude Hirel, discussed with 01 MENSUEL the major aspects of this exceptional action program.

[Question] What are the major features of the action program defined by the government?

[Answer] There can be no true industrial policy if we have not first defined an utilization policy, and if the whole is not supported by a research policy. The action program therefore has two balanced aspects: a utilization policy and a policy of industrial research and development. Seven topics have been defined for the first of these: some are sectorial and address themselves to industrial users, business users, as well as the administration and the national public sector; the others are horizontal, and concern training, employment and labor, information and communication, as well as the impact of information technologies.

Each of these topics has led to the definition of specific actions. In the administration and the public sector for instance, we propose to redefine current regulation procedures in data processing and office automation equipment.

[Question] Should we therefore expect an even stronger encouragement to "buy French" than we have experienced during the past 15 years, an encouragement which we know has not always been welcomed by users?

[Answer] On the contrary, we want to establish a climate of trust with users. Each enterprise in the public sector will establish a master plan--and they are all still far from having drawn one--which will be translated into quantitative terms and will make it possible to achieve contractual obligations for equipment.

[Question] How is this utilization policy translated into industrial policy terms?

[Answer] We have defined 11 sectors: components; consumer electronics; professional, civilian, and military electronics; data processing; office automation; medical electronics; scientific instrumentation; data processing, software, and data bank services; space; telecommunications; automation and industrial data processing.

In each of these sectors we have examined the situation very closely. In general, all of it represented a turnover of 96 billion francs in 1981, with a balance of trade deficit of 6 billion.

What concerns us, is that at the present growth rate of about 3 percent per year, the branch can only backslide. Without specific action, the deficit would triple by 1986: we would suffer job losses in a domain which is developping more rapidly than the gross national product, and which is therefore one of the only ones in which we could hope for an increase in employment.

This is an extremely disturbing situation, not only for this industry, but also for the economy as a whole. Can we for instance develop the automobile industry without mastering electronic ignition?

After having defined the principle of interdependence among the 11 sectors of the branch, the action program has consisted in determining the potential, trends, and reasonable objectives of each of them.

This having been done, specific industrial projects were established in each sector with the manufacturers and services involved. These projects were accompanied by a proposal for reinforcement and reorientation of industrial resources whenever necessary.

[Question] What means do you have available to fulfill these goals?

[Answer] This is where the public sector fully plays its coordinating role. Very soon, the nationalized enterprises will propose their own enterprise plans as part of the overall strategy that we have defined.

These enterprise plans will describe the strategies to be used for the selected objectives, proposed structure modifications, annual budget drafts, and associated financing requirements.

These plans, which will be established under the responsibility of the enterprises' administrations, will be the subject of extensive internal discussions--both technical and social--with their social partners.

A plan contract between the government and each enterprise, formulated on the basis of the enterprise plan, will define the means contributed by each party to achieve the defined goals.

[Question] Will the encouragement also extend to private enterprises?

[Answer] For the private enterprises, agreements will be proposed which will make it possible to involve these enterprises in the national effort, and which will subordinate the granting of state financial support to obligations in research, investment, and stockholder financial contributions.

[Question] Do these projects leave room for some competition among French enterprises?

[Answer] As I have already indicated, we want to optimize the utilization of public resources.

Whether it involves nationalized groups (Thomson, CII-HB, CGE, Matra), private groups, or PMI (small and medium sized industries), French industry will have to concentrate its forces. The government will use the weight of the nationalized sector (49 percent of the branch) to develop the strategic sectors. The strategies of the nationalized groups will have to be concerted in each sector so as to take into account the need to concentrate these investments as much as possible on one or two groups.

For the sectors in which competition can occur among industrial groups, the state aid will be based on criteria of competence and appropriatness to the overall strategy, avoiding face to face competition among companies. However, we will aim at a consonance, in concert with the enterprises.

At the other extreme, the PMI sector as a whole must constitute an essential resource for innovation, both in research and technology. The state must encourage this aspect, both structurally and financially. The role of subcontractor to large enterprises must be as profitable as possible for the PMI sector.

[Question] What are the major lines of action anticipated in the sectors most closely related to data processing?

[Answer] The objective in data processing itself is clearly to restore a balance in utilization. For this, we want in particular to first see a preparation of structures and a continued effort toward internal organization, aimed at restoring competitiveness and service quality. With CII-HB and our research potential, we believe that we hold a very good hand.

More particularly, we will consolidate the line of intermediate (management) systems, which corresponds to a large slice of the European market and to a steady investment on the part of CII-HB for several years. A very special effort will be made to offer possibilities for interconnecting heterogeneous equipment, starting with CII-HB's DSA network architecture, which will be maintained and expanded.

In mini-data processing and distributed data processing, we will strive to avoid duplicating research and development expenses, as well as the scattering of industrial and commercial investment efforts. This sector will benefit from voluntary efforts within the framework of the national project for industrial research and development in elementary modules for mini- and microcomputers.

In the field of micro-data processing, a large effort will be devoted to mass production while encouraging individual innovation.

[Question] How about components?

[Answer] Again, in integrated circuits, the scattering of resources does not appear to be the best guarantee for success, and a regrouping of industrial centers together with a reinforced effort in research and development, should make it possible to achieve a leading position in Europe, and to progressively obtain technologic independence from the United States.

In discrete circuits, the efforts will be concentrated in areas of growth and advanced technology.

In passive circuits, we will seek to limit losses in the coverage of our market through the exploitation of some specific slots and through licensing agreements.

[Question] At what stage are the office automation projects?

[Answer] At a consolidation of existing strengths: private telephones, electronic mail, which together with the willingness to invest in mini-data processing, should allow the French industry to establish its position on this rapidly growing market, and leave it free to fill its gaps, particularly in reprographics, electronic typewriters, and printers, while taking advantage of notable technologic changes.

The development of new products (text processing, electronic filing, networks, and so on) will ease this penetration.

[Question] How about the other fields associated with data processing, such as the service industry?

[Answer] France's position in software and services is considered to be good. Nevertheless, there are plans to improve it by reinforcing the industrial nature of production, by investments in programs, and by a strong development of data banks.

Lastly, industrial data processing and automation will benefit from a stimulated demand, as part of a program called "productics," which will reinforce the action of data processing engineering companies.

[Question] But will we really have the means necessary for such a policy?

[Answer] The investment program has been estimated at an overall figure of 140 billion francs in five years, derived both from the government and enterprises. Details have not yet been specific. These are figures that are clearly different from those usually announced for data processing, and the difference should not surprise us.

As an example, the three areas in which France has succeeded in establishing a competitive industry, are professional electronics, space, and telecommunications. Why? Because three elements were defined without ambiguity: precise objectives, large financial resources, and an evaluation structure.

This is all we want now. This is not a matter of playing the role of sponsor, nor that of a lender expecting more or less to be reimbursed depending on a hypothetical success. On the contrary. Several measures will be implemented when the state will finance and launch specific projects, and will receive the results in proper order. All these measures will be included in the enterprise plans approved for companies in the private sector.

Thus supported for the development of competitive products, French industrialists will be placed in a good position to withstand international competition. They will then have to trust to their own dynamism.

11,023
CSO: 3698/9

CIT-ALCATEL DEVELOPS NEW IC PACKAGING TECHNIQUE

Paris ELECTRONIQUE ACTUALITES in French 10 Sep 82 pp 1, 15

[Article by J. P. Della Mussia]

[Text] CIT-Alcatel has just introduced a new type of packaging for complex integrated circuit (IC) chips, which falls between the TAB and the chip-carrier in terms of price/performance ratio. This package requires only a leadframe to support the chip and the leads, and a drop of epoxy to protect the assembly.

Preliminary life tests carried out over more than six months have been entirely satisfactory; environmental tests will be completed at the end of 1982. But CIT-Alcatel is already accepting orders for custom hybrid circuits that use these packages for the IC's, and their mass production could start at the beginning of 1983.

Four Concurrent Packages

Four major types of IC packages are currently competing for miniaturized circuits: the flip-chip, the TAB, the chip-carrier, and the miniature DIP. The TAB package is justifiable only for runs of at least two million parts, except in the case of specific technical requirements (very fast circuits). The flip-chip requires the use of special chips, with adapted contacts (but the outputs of these chips do not need to be peripheral, which is a primordial advantage for complex circuits; this technology therefore remains ideal for large IC users such as IBM).

The chip-carrier is very expensive in ceramic (35 francs with 68 leads, without lid, in small quantities) and still relatively costly in plastic. Moreover, it becomes very large (2" x 2" for 150 leads) as soon as the number of leads increases; it is therefore desirable in practice to attach several chips per package.

Lastly, the miniature DIP (or SO package) is an interesting compromise, but its number of pins is actually limited to 16, and no manufacturer expects to exceed 24 pins in the future.

These considerations have led CIT-Alcatel to design its own package for circuits with more than 24 pins, a package that is less expensive and smaller than the chip-carrier, and which presently still remains the most attractive for small batches. The new package thus has the same advantages as the chip-carrier in terms of testing and fabrication (automatic cabling) by a customer with standard chips. But it additionally offers the advantage of higher density, greater economy, and independence from substrates manufactured abroad.

Very Simple Fabrication

The CIT-Alcatel packages start with a square metal grid composed of four rows of four leadframes (also square-shaped), designed to receive the IC chips; this grid is placed on an array of 16 small plastic squares, each facing a leadframe and a lower surface of the latter. The chips are then bonded to the center of each frame, and the chip is welded to the fingers of the leadframe.

A drop of epoxy is next deposited on each chip, and allowed to spread on the area defined by the plastic squares located under the grid. As a result, only the tips of the leadframe fingers connected to the grid's armature emerge from the drop of epoxy. Following this, all the leadframe fingers are cut at their outer extremity, except two, which are left for mechanical support of the assembly. Lastly, the assembly is tested and marked before (or after) the final cutting.

In particular, CIT-Alcatel transfers these circuits, as in the case of miniature DIP's, on ceramic substrates that the company is attempting to standardize at 2" x 2" or 2" x 1" (these substrates can also accept a heat sink on the back of the interconnection surface).

Automatable Fabrication

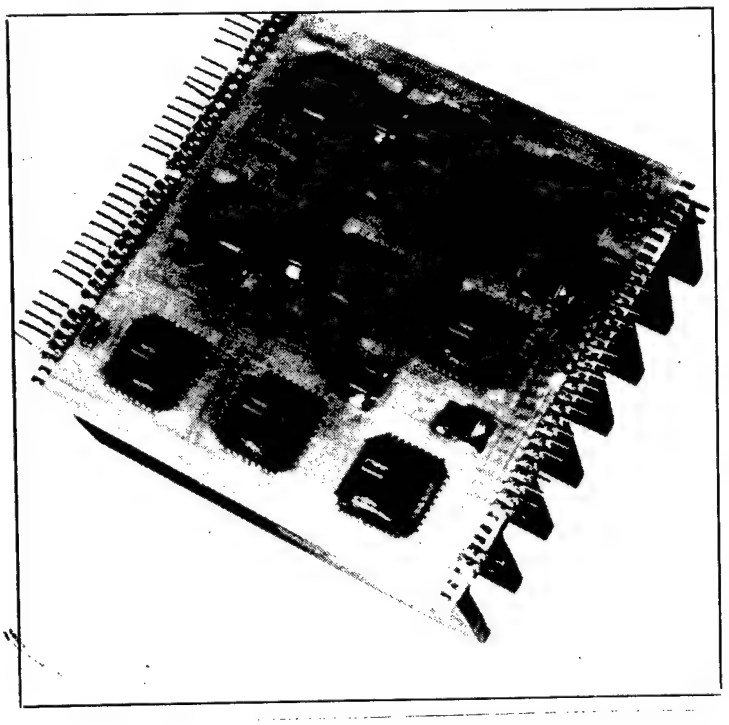
Compared to the TAB, the CIT-Alcatel package has the advantage of using a very inexpensive leadframe, which can be supplied in 15 days by many subcontractors. Moreover, all the circuit fabrication can be automated, whether for attachment or welding. (However, existing loading machines must be modified). If the chip supplier changes his circuit, a modification of the welding machine program is all that is needed to maintain production automation.

The pin-to-pin distance is only 0.75 mm, which makes it possible to manufacture circuits with 24 to 100 pins. (This distance is to be compared to the 1.77 mm of the chip-carrier, or the 2.54 mm of the conventional DIP).

Finally, the TAB remains the most interesting package only for very large productions of all the families of circuits in use (in general, 90 circuits out of 100 are requested in runs much smaller than the rest), and for extreme miniaturizations.

The cost of the package is definitely lower than that of a chip-carrier since it avoids the purchase of a package, the installation of a lid, and a verification of hermeticity. With the CIT-Alcatel process, the epoxy drop is placed automatically.

CIT-Alcatel has already manufactured with this technology, a prototype card for the E10, that combines 60 gate arrays on eight hybrid circuits. The company is at the same time working on a related technology which could lead to dimensions identical to those of the TAB.



11,023
CSO: 3102/454

RENEWED INTEREST IN MAGNETIC BUBBLE MEMORIES

Paris ELECTRONIQUE ACTUALITES in French 17 Sep 82 p 9

[Article by F. Grosvalet: "Bubble Memories: Renewed Confidence"]

[Text] When it came to MBM's [magnetic bubble memories], SICOB 81 [Exposition of Office and Business Supply Industries and Office Organization - 1981] was marked, on the part of users, by a lack of real confidence in them, and on the part of manufacturers, by a lack of long-term prospects, for the most part. Today, the situation appears less cloudy.

All those who were present in the marketplace in September 1981 are still there today, and clients now have more confidence in the product; the big potential users have reviewed their positions and seem prepared to bring out products based on MBM's.

Certain of the stumbling blocks we reported at the time of the April Components Show (see ELECTRONIQUE ACTUALITES of 9 April 1982) are beginning to disappear, thanks especially to a second-source agreement between Intel and Motorola (see ELECTRONIQUE ACTUALITES of 25 June 1982). The MITEL [expansion unknown] episode (ELECTRONIQUE ACTUALITES of 30 October 1982) contributed nothing whatever to the credibility aspect; the agreement with Intel was mainly of interest to the Canadian firm, which lost no time in breaking it as soon as it felt no further need for it, Motorola having provided it the second source of supply it sought, without its having to commit itself to costly production equipment. And the 4-Mbit memories--a capacity at which the MBM becomes highly attractive for a number of applications--will not now be long in making their appearance. Intel plans to bring its version out in sample quantities in November or December this year and to be in volume production in 1983, and Fujitsu is to introduce one by the end of next year. The Japanese one, which will be longer in making its entry into the market, will probably use a new technology, that of nonimplanted disks, which is suitable only for 16 Mbits and on which, as far as we know, only four laboratories throughout the world are working (IBM, Bell Labs, Fujitsu and LETI [Electronics and Data Processing Technology Laboratory, Grenoble]).

Today, although there is still a certain lag in the data processing market for MBM's, the industrial and professional ones appear to have gotten well off the ground. For Intel itself, MBM's are beginning to no longer be a technical novelty; they are becoming standard items in current use, for which applications are becoming more and more numerous. As their prices continue to drop, more and more markets are opening up for them. They have progressed from the harsh-environment sector (military, space, shop automation) to that of telecommunications (private automatic exchanges) and portable applications (terminals, data loggers, personal computers); and now, the office and business systems market is about to open (point of sale and banking terminals, electronic typewriters).

A Second-Source Agreement Soon for SAGEM

On the French side, SAGEM [Company for General Applications of Electricity and Mechanics] has still not chosen among the remaining four manufacturers; talks are under way and an agreement is thought to be imminent, but it is not known as yet when or with whom. The other four are not being any more loquacious; Intel still looks forward to further second-source agreements, and so does Fujitsu, but neither one will comment!

The French company is pursuing its military and space program, which is now well along, in that, it will shortly deliver to the ESA [European Space Agency] a space recorder with a capacity that could be as high as 256 Mbits (It has already furnished to the military the prototype of a fast auxiliary memory with a capacity of around 100Mbits). SAGEM, at its Eragny plant, is continuing with the industrialization phase of 256-Kbit chips using permalloy technology and has actualized all the necessary peripheral electronics for this type of components, but only for the professional market. Its entry into civilian applications, particularly the bringing out of a 1-Mbit unit, will depend a great deal on the second-source agreement it expects to strike, as well as on the future of an MBM "plan" to be financed in part by the government (see ELECTRONIQUE ACTUALITES of 12 and 19 march 1982).

Tecnologies of the Future

In addition, SAGEM is continuing its technological cooperation with LETI on future generations of MBM's. The laboratory is doing work in two fields: The production of 256-Kbit chips by the wafer stepping photoreduction process, and a feasibility study on memories using DNI [nonimplanted disk] technology in the 8-micron range. It is also carrying out exploratory studies on thin-film conductors involving the development of new garnets. The latter technology, which obviates the need for rotary field coils, should enable the attainment, with new materials, of bit rates around 2 Mbits/sec. (800 Kbits/sec with present garnets).

The DNI technology, in which nickel-iron components are replaced by zones in which the anisotropy is locally embedded superficially in the epitaxy film (this is done by means of multiple ionic implantations), still needs

a rotating field produced by coils, which limits the data bit rate to some hundreds of Kbits/sec. The advantages of this technology, however (easier photolithographic operations, entirely planar technology, minimum required dimension of 1.5 to 2 times the diameter of the bubbles versus 0.7 in the permalloy technology, and smaller rotary field amplitudes needed), should enable the production of very-low-cost mass memory MBM's for microprocessors and minicomputers.

9238
CSO: 3698/8

ELECTRONICS

DISMANTLING OF AEG-TELEFUNKEN UNDER WAY

Paris ELECTRONIQUE ACTUALITES in French 3 Sep 82 p 3

[Unsigned article]

[Text] Placed under court order on 9 August, the AEG-Telefunken group is awaiting the verdict of the report submitted by the government's investigation commission. The analysis and recommendations of this report will determine the outcome. Even though the government refuses to participate in the rescue, it nevertheless is extending its guarantee for 600 million marks of credit intended for exportation. In turn, the banks have granted a credit of 1.1 billion DM to solve some immediate problems. The dismantling seems to be inevitable, and many discussions have been held with possible partners; Grundig appears to be a serious candidate. Licensing will be necessary under any circumstances.

Just like two years ago, AEG-Telefunken is in a critical situation. The placement under court order on 9 August provides it with a short respite. Some sectors, particularly the investment goods and the technical equipment, are not affected and continue to operate normally. AEG-Kanis will be ready to deliver the first two turbines for the gas pipeline. The court order reimburses 40 percent of the debts to creditors, except those smaller than 10,000 DM, which are fully covered. The measures taken by the supervisory council will determine the future of the group; many factors, among which are credit and employment, will depend on these measures.

Call for Credits

In the name of market economics, the German government takes only a remote interest in the problems of the group. It does however secure the credits of 600 million DM intended for exportation (a subsidiary is to be created for this purpose), which the European commission has endorsed. And it also exerts pressure on the banks to obtain credits for settling current affairs. At present, 1.1 billion DM are released by the consortium of 24 banks which controls the group. Laender is also helping, but in a non-systematic way. The two subsidiaries, Neff and Zanker, specializing in household appliances (and currently under court order), are using a credit of 10 million DM extended by the Bade-Wurtenberg government.

The Partners

In the long range, it is not credits that need to be obtained, but new partners for all or part of the activities. Many companies are already in line for this dismantling. While Thomson-Brandt and General Electric seem to have pulled back to await developments, Grundig is negotiating its participation with Telefunken for recreational electronics; Telefunken should then end the agreement it has with JVC for videotape recorders. Otherwise it could manufacture both JVC's VHS, and Grundig's Video 2000, and would be in a dominant position on the market, a situation which the federal office for cartel control wants to prevent. Bosch and ITT could be additional partners in Germany for this sector. In turn, United Technologies would be interested in a cooperation in the semiconductor and equipment field. Electrolux would buy two subsidiaries, Zanker and Neffwerke, both of which specialize in household appliances.

The Price to Pay

In addition to dismantling, the group cannot make it without licensing. It is estimated that a minimum of 23,000 jobs will have to be eliminated. Indirectly, even though AEG is honoring its contracts, the fact that each new contract is subordinated to financial guarantees from banks, slows down orders and reopens the question of the existence of some subcontractors, especially if they do not recover their funds. The employment cost could be heavy for Germany.

In any case, the solution being sought shunts out possible Japanese buyers so that they will not increase their pressure in Europe, and falls within the context of a European movement.

11,023
CSO: 3102/453

INMOS SAMPLES 64K DYNAMIC RAM CHIP WITH 100NS ACCESS TIME

Paris ELECTRONIQUE ACTUALITES in French 10 Sep 82 p 16

[Article by F. Grosvalet]

[Text] Nearly one year behind schedule (see our 17 April 1981 issue), INMOS has begun sampling a very fast 64K dynamic RAM; it is available in two versions with access times lower than 150 ns: IMS 2600-10 (100 ns access time), and IMS 2600-12 (120 ns) (the fastest current 64K DRAM's offer 150 ns access times). These memories are available in France in small quantities (10 to 20) at Tekelec Airtronic, which represents the English company in our country. They will at first be produced in the United States, and then in Newport (Great Britain), which is expected to become the company's largest production center.

Despite its late arrival on an already saturated market (some 17 manufacturers of this type of memory were counted in April), INMOS hopes to sell several thousand 64K DRAM's during this year, and several millions in 1983. This may seem ambitious in view of their prices: 28 dollars per hundred for the 2600-10, and 20 dollars for the 120 ns. However, these are sampling prices and are consequently expected to drop very rapidly. They should even be halved by the end of the year, which would put the IMS 2600-10 at 14 dollars at that time (which will still be twice the current official average price of a 150 ns device). It thus remains to be seen whether the very specific users of this type of memory will be ready to pay for the speed.

But the English company has the advantage of being the first on the market (mass memories for high performance computers, graphic displays), a market which it estimates at 5 percent of the total market for 64K dynamic RAM's in 1983.

In addition, INMOS is preparing two other 64K DRAM's: a 16K x 4 with pinning identical to that of TI, the IMS 2620, which should be sampled at the end of the year; and an 8K x 8 for the beginning of 1983, for which it forecasts a market of 3 million units next year and 22 million units in 1984.

We should point out that the INMOS memory differs by two characteristics which lend it its speed: operation in the nibble mode, and on-chip refreshing through CAS-before-RAS.

Nibble Mode

The nibble mode invented by INMOS is now generally recognized by computer manufacturers as a requirement for 256K dynamic RAM's, which allows the user to access four bits of data, in write or read mode, from a single 16-bit address, thus reducing the access time. The second characteristic, which the English company calls CAS-before-RAS, allows on-chip refreshing in 256 cycles every 4 ms, each time the CAS signal precedes the RAS signal, while leaving pin 1 unconnected, a feature which is very important for future 256K compatibility.

We might remember that this memory is fabricated with NMOS technology, 2.7 micron lines, and two levels of polycrystal silicon; it includes two groups of four rows and two redundant columns, and measures 22.5 square-mm. The IMS 2600-10 and 2600-12 have cycle times of 160 and 190 ns respectively, and maximum consumptions of 468 and 413 mW at 5 V, as well as 22 mW on stand-by.

Lastly, they are available in ceramic 16-pin DIP packages, and should soon also be available in plastic 16-pin DIP and 18-pin chip-carrier packages.

11,023
CSO: 3102/453

WORK BEGINS ON EUROPE'S LARGEST PHOTOVOLTAIC POWER PLANT

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 22 Sep 82 p 5

[Text] Frankfurt, 21 September. Work has been begun on the North Sea island of Pellworm on the construction of Europe's biggest solar power plant. Starting July 1983, the sun is to provide current for the spa center and the surrounding houses. On an area of about 16,000 m^2--corresponding to about two soccer fields--the New Technologies Sector, Space Travel, of AEG [General Electric Company]-Telefunken, is building the 300-kw solar generator which correctly converts sunlight into electric energy.

To be able to continue the agricultural use of the pasture land on the island, the solar generators are being set up on frames with a height of at least 1 m. In this way, the sheep can graze unhindered in the fields. The project, presumably involving DM11 million, is being decisively financed by the Research Ministry and the EC. The facility is also intended simultaneously to gather technical data during the testing phase; these data are necessary for the planning of future solar power plants into the Mw range. Questions of economy and operation here are essential criteria. In the past, experiences have been gathered with solar plants most in the countries of the Third World.

The spa center is a customer for solar energy because it has its highest energy requirements during the summer. A battery storage unit is supposed to supply the current during the night and during bad-weather periods. Because more energy is available than would be needed by the spa center, surplus energy can be supplied to the power supply grid of Schleswag. Today, a kilowatt-hour of "solar current" still costs about DM2. The solar researchers of AEG, who are based at Wedel near Hamburg, however are confident that they can reduce the price to DM 0.30 through transition to large-series production between 1986 and 1988.

The EC is supporting the development of photovoltaic energy sources in a total of 16 projects. One of the objectives of these development efforts in Western industrial nations--in addition to securing the energy supply and providing help for the Third World--is also the opening up of an export potential. The order of magnitude of the German market emerges from a study by the Federal Association of Solar Energy, Incorporated, published in 1982. Assuming a share

of regenerative primary energy sources of 2 percent out of the world's primary energy consumption is 2000, a German market share of more than DM6 billon annually would be possible in the light of present-day prices.

5058
CSO: 3698/19

NETHERLANDS PROCEEDS CAUTIOUSLY WITH WIND ENERGY PROGRAM

Paris AFP SCIENCES in French 8 Jul 82 p 28

[Text] The Hague--The Netherlands government has decided to proceed--cautiously, for the time being--with its wind energy support program, by providing backing for the construction of an experimental array of 10 to 20 wind engines, each developing 0.3 to 0.5 megawatts. This decision was announced on 7 July by the Council of Ministers, which, however, postponed until later the implementation of a more ambitious project.

This project, which goes under the name of its inventor, engineer Lievense, would consist of building a wind-engine capacity of 800 megawatts which would feed a reservoir lake 30 meters above sea level. A bleed-off from the lake would drive conventional hydroelectric turbines to smooth out the irregularities of the wind.

Before undertaking a work of such titanic scale, the government has preferred to await the results of its experimental program to asses the economic viability of using the wind and to induce Dutch industry to explore this sector more in depth.

In the report on which the government has based its decision, the experts state that considering the small capacity of the experimental project, the electrical network can absorb the output of the wind engines without the need of providing a reserve energy buffer system.

The experts have calculated that wind energy can become economically viable if the prices of the other energies continue rising and if, on the other hand, the cost of the wind turbines, with their accessories, can be kept down below 2,500 florins (6,250 francs) per installed kilowatt.

The project is to be financed half by the government and half by the electricity producing enterprises.

Paradoxically, the country of the windmills has been very hesitant about using wind energy, particularly in view of the availability of natural gas

reserves, which represent greater revenues for the government. The few windmills operating experimentally in the country are for the most part of Danish origin, and their owners are constantly coming up against niggly obstructionism on the part of the authorities responsible for urbanism and land use.

9238
CSO: 3698/8

FRANCE'S INDUSTRIAL STRATEGY TAKES SHAPE

Paris SCIENCES ET AVENIR in French Sep 82 pp 12-13

[Article: "'Productics,' Weapon for an Economic War"]

[Text] "Productics," the daughter of robotics and mechanics, is the new discipline born of the two reports by Petiteau (robotics) and Persuy (mechanics). According to the Minister of Research and Industry who coined this neologism, this should be considered as "the new indispensable weapon in the state of economic war in which we find ourselves."

Indeed, we have a great need for it in the light of these two reports submitted at the end of July to Jean-Pierre Chevenement. As far as robotics is concerned, France is perhaps not lagging from the scientific point of view, but industrially, she ranks fifth in the world with an investment of 190 million francs in 1981 behind Japan, the United States, Sweden and Italy. However, the ambition shown is for France to become the world leader by 1990.

For the time being, the automobile industry alone, and of course Renault, the number one French manufacturer (30 million francs and 60 robots in 1981), has truly integrated the robotics phenomenon. The mission, therefore, proposes the creation of an interministerial committee on robotics, the support of the ARA (advanced automation and robotics) program launched over two years ago as well as of pilot operations, for example, the creation of plants capable of processing different products. Priority is given to the training of 2,400 persons (1,200 automation specialists, 1,000 teachers and industrial workers, 100 specialists and 100 "generalists") and to the hiring of 410 research workers. The budget anticipated has been evaluated at 2.4 billion francs over a three year period.

Mr Jean Persuy's report on mechanics also brings to the forefront the French weaknesses without, however, considering that industry, which is essential in the national economy, as a disaster. It exports 50 percent of its production, employs over a million people, ranks fifth in the world; this is the situation. But, as noted in the report, the overall effort devoted to that industry is three times smaller than, for example, in Germany. It is therefore time to react by setting up training programs and increasing the general technical level, essentially of the small and medium size firms. It

would be useful to base development work on only a few pilot firms but all the firms should participate in this undertaking.

Finally, an important remark should be noted, which has already been emphasized in the two-year old report prepared by the Academy of Sciences on "the Mechanical Sciences," namely that mechanics has strategic aspects which a nation such as France cannot afford to neglect.

9286
CSO: 3102/447

PROGRAM OF GOVERNMENTAL ACTION IN ROBOTICS, AUTOMATION

Paris ZERO UN INFORMATIQUE MENSUEL in French Oct 82 p 58

[Text] In order to overcome the present handicaps and turn around an alarming situation, a program of governmental action in robotics and automation is about to be made public. This program is based closely on the work of the Petiteau mission, and contains the following nine points:

1. The establishment of a CIR [Interministerial Committee on Robotics], through the expansion of the CODIS [Committee for the Development of Strategic Industries]-Robotics group. This committee will act to orient governmental actions and coordinate the policies of the various ministries and departments, and the funding allocated. It should have a budget for 3 years (83/84/85) of 2.4 billion francs, distributed as follows: 235 million for equipment; 1.94 billion for specific coordinated actions; and 225 million for subsidies.

2. The establishment and/or strengthening of specialized areas of competence. The Besancon area is under study to handle light robotics and peripheral robotics. There an automated production institute, to be set up, will be responsible for the qualification of components. The Toulouse area, called "Midi-Robots," based on an industry-laboratory association, will handle the preliminary development of robotic products with a strong computer and software component. The resources planned: 75 million a year. Other units are also planned, in the Paris region, in Nancy, Strasbourg, Aix-Marseille, Tarbes, and Nantes.

3. The start of the following major research programs: ARA [Advanced Automation and Robotics], to be expanded to include artificial intelligence (80 million over 3 years); a new "components" program (150 million over 3 years); economic and social sciences; employment (5 million over 3 years); continuous process automation (20 million); relations with other disciplines

(45 million). For developmental aid (ANVAR [National Agency for the Valorisation of Research], ADI [Data Processing Agency], etc.) the resources allocated are 1.4 billion over a 3-year period.

4. The conducting of pilot operations in flexible assembly workshops in manufacturing industries. The proposed budget: 258 million over 3 years.

5. The preparation of an integrated robotics training system, to be given through the present educational structures: 30 million over 3 years.

6. Information on and promotion of new techniques by the AFRI [French Industrial Robotics Association] and learned societies: AFCET, ISF, and SEE [expansions unknown]. Some of the activities planned: the formation of a computerized reference system, the founding of a journal, and conducting of exhibits. Cost: 20 million over 3 years.

7. Qualification of components of robots and peripheral equipment, the establishment of quality and standards. Cost: 60 million over 3 years.

8. The structuring and organization of industries, of SSCR [Robotics Services and Consulting Companies], aid for the establishment of robotics companies, the organization of information systems for distributors: 120 million over 3 years.

9. The establishment of a procedure for financing equipment by extending the MECA [Advanced Design Machines and Equipment] (ADEPA [Agency for the Development of Automated Production]), and aid from the ADI.

According to Maurice Petiteau, we must create "a new way of thinking and working."

Along with Mr Petiteau, we hope that these measures he is advocating may be a decisive factor for change in our industry.

7679
CSO: 3698/15

ASEA DEVELOPS LARGE WELDING ROBOT FOR AUTO INDUSTRY

Stockholm NY TEKNIK in Swedish 8 Jul 82 p 2

/Article by Jan Segerfeldt: "Large Welding Robot for Auto Industry"/

/Text/ Vasteras--Asea's robot family has received a new member. The newborn is the biggest one so far; it can lift 90 kilograms. Automobile factories all over the world will become its place of work.

Asea will now market a new robot, which specializes in spot welding. It was developed primarily for the needs of the auto industry. The new robot features a 50 percent greater reach and a 50 percent greater lifting capacity. This means that it can lift 90 kilograms and can reach nearly 4 meters with its arm.

One out of every five robots sold by Asea works with spot welding. Gluing, arc welding, polishing, burring and cleaning of castings are other tasks. Many robots are also used to service groups of machine tools.

"We have 30 percent of the European robot market," says Bjorn Weichbrodt, head of the robot division.

In the United States, the automobile nation, the company occupies third or fourth place. Asea hopes to take yet another step forward with the new spot welding robot and a new assembly plant near the auto city of Detroit.

Even before marketing of the new robot had begun several had been sold, but only in the Swedish market. It is Saab in Trollhattan which ordered 60 robots, a considerable number of which are the new spot-welding robots.

As NY TEKNIK wrote in issue 1982:5, the other Swedish automobile manufacturer, Volvo, chose Cincinnati robots for its production of the 760 series. It is possible that the decision would have looked different had Asea's new robot been completed earlier.

The reach is particularly important for auto manufacturing. The new Asea robot can reach nearly 4 meters, compared with 2.5 meters for the 100 Cincinnati robots at Volvo.

The safety functions have been improved with the introduction of this robot. (A Japanese robot killed an operator earlier this year.)

Some examples:

--During programming, when the operator needs to work close to the robot, the speed of movement of the robot cannot exceed 25 percent of maximum.

--The control lever of the hand-held control unit has a "deadman feature." A panel must be depressed at the same time as the control lever is moved. This will prevent unintentional movement by the robot, if the control lever should be reached by mistake.

11949
CSO: 3698/2

BRIEFS

COMPOSITE MATERIALS--The CODEMAC [Committee for the Development of Composite Materials] and Bordeaux Air and Space are organizing a mission to Japan to attend the ICCLIV [4th International Conference on Composite Materials] to be held in Tokyo from 25 to 28 October of this year. This mission is to present the actions taken in France for the development of composite materials, and make contact with the major industries in this field. A full schedule of activities is planned for this occasion. In addition, this program will permit the delegates to take part in the International Symposium on Carbon, to be held in Toyohashi from 1 to 4 November 1982. A delegation including representatives of the major university laboratories and air and space firms in the region is to take part in this mission. [Text] [Paris INFORMATIONS CHIMIE in French Jun/Jul 82 p 67] 7679

CSO: 3698/15

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